to the present time only yielded us about two thousand species of Rhopalocera. It is evident, therefore, that the Neotropical region, which includes tropical South America as well as Mexico and Central America, is likely to prove to possess, when a final and exhaustive catalogue of the species is made, the richest Rhopalocerous fauna in the world. The family of the Hesperiidæ is far richer in species in this region than anywhere else. More species of these interesting and often puzzling insects occur in Mexico and Central America than are found either in the tropics of the Indo-Malayan region or in the tropics of Africa. The Erycinidæ are also characteristic of the region, and the number of species of this family in the total vastly exceeds the number of species found in all other regions of the globe combined. The Nymphalidæ lead all other families in the number of species, but the number of species, while great, is not equal to the number that is found in the Ethiopian subregion, nor is the number of species as great as that known to occur in the Indo-Malayan subregion.

The general conclusions reached by Mr. Godman as to the distribution of species within the territory are best expressed in his own language. He says: "Our study of the Central American butterflies proves conclusively (1) that the fauna is mainly a northern extension of that of tropical South America, extending on the Pacific side to Mazatlan and on the Atlantic to a little beyond Ciudad Victoria in Tamaulipas, some few species on each coast reaching the southern United States, with, of course, many peculiarly modified forms in the region; (2) that there are a considerable number of Nearctic genera and species coming down the central plateau a certain distance into Mexico, and some even into Guatemala, as *Argynnis, Vanessa, Limenitis, Grapta,* various *Colias,* etc.; (3) that there are no strictly alpine forms, the insects met with above the tree-line being mostly stragglers from below, such species as occur at the highest limits of the forest being very like those of similar Andean localities, these mostly belonging to the genera *Euptychia, Archonias, Catasticta, Pereute, Enantia,* etc.; (4) that the fauna of the Atlantic slope to perhaps as far south as Costa Rica is incomparably richer than that of the Pacific, this being particularly noticeable in the Ithomiina, the Erycinidæ, the genera *Thecla* and *Papilio,* etc.; and (5) that some of the purely tropical genera do not reach north of Nicaragua, Costa Rica or Panama, as *Eutresis, Scada, Cœrois, Callitæra, Hetœra, Oressinoma, Narope, Panacea, Megistanis, Hypna, Zeonia, Ithomeis,* etc."

Within the limits of a brief review such as this it is impossible to take up and consider many of the interesting details in reference to distribution which present themselves to view upon a careful study of the work. The writer commends to the careful attention of all students of entomology the introductory chapter of Volume I., which epitomizes in a masterly manner the results of the years of study which have been devoted by the learned authors to the subject in hand. To the comparatively few who are devoting themselves to a critical study of the Hesperiidæ that portion of the work devoted to this family is of extreme value. It is no exaggeration to say that it is one of the most perfect examples of careful monographic work which has ever appeared in the English language. The amount of painstaking and microscopic research which has been performed in order to attain the results which are given has been prodigious. It is certainly to be hoped that the work will find a place in all the great libraries of the New World, for without access to it the student of entomology in America is certain to find his labors greatly retarded.

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A Laboratory Course in Bacteriology, for the use of Medical, Agricultural and Industrial Students. By Frederic P. Gorham, A.M. Philadelphia and London, W. B. Saunders & Co. 1901. 8vo. Pp. 192.

In this unpretentious laboratory guide the author has succeeded in combining technical accuracy with sound pedagogy in a manner which will commend the book to teaching bacteriologists. The directions for even the commonest processes have very obviously stood the

test of actual use with classes before being crystallized into their present form. The particular merit of the book lies in the fact that the author has carefully described small points of technique which too many others writers have left for the student to learn for himself through experience more or less bitter.

The contents of the book are as follows: Chapter I., Microscopical Examination of Bacteria, with a description of the ordinary processes of staining; II. and III., Morphology and Reproduction, with methods of straining flagella and capsules; IV., Classification of Bacteria—a synopsis of Migula's genera; V. and VI., Sterilization, and Preparation of Culture media; VII., Cultures of Bacteria—a description of the ordinary culture methods, with full tables of descriptive terms; VIII., Determination of Species, contains a list of diagnostic characters, a standard chart for full description of a species, a key for tracing the more common forms, and a synopsis of Chester's scheme of classification by groups; IX., Bacterial Analysis of Water, Milk, Air and Soil; X., Pathogenic Bacteria—directions for the study of eleven typical pathogenic organisms. The appendix contains an account of Wilson and Randolph's method of measurement by photography, a description of the common contaminating moulds and yeasts, and a very useful list of synonyms.

Not a few points and methods are described which have hitherto appeared only in monographs; some are here published for the first time. The text is fully illustrated, and many of the cuts are new.

On account of its thoroughly modern and in many respects original treatment of the ordinary technique of bacteriology this book will prove useful not only to the bacteriologist, but to the botanist who employs bacteriological methods in pathological or systematic work.

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SOCIETIES AND ACADEMIES.

THE GEOLOGICAL SOCIETY OF WASHINGTON.

THE 122d meeting of the Society was held on Jan. 8. The first paper was by Mr. Charles D. Walcott on 'The Outlook of the Geologist in America.' This was the substance of the presidential address, before the Geological Society of America, at Rochester.

Mr. M. R. Campbell then presented a paper on 'Recent Geological Work in Pennsylvania.' The author summarized briefly the character and scope of the mapping of the Pennsylvania coal fields which is now being carried on by the United States Geological Survey in cooperation with the State. Up to the present time seven quadrangles, embracing an area of 1,600 square miles in the bituminous coal fields, have been geologically surveyed.

It is generally admitted that the weakest point of the Second Geological Survey of Pennsylvania was its lack of adequate base maps on which to portray the geological data gathered in the field. It was impossible to locate geological boundaries correctly upon the crude county maps, which were the only ones available. With the aid of the recent detailed topographic maps, it is believed that the geological boundaries have been determined within an error of a few feet. The importance of such close mapping is self-evident from the fact that land underlain by the Pittsburg coal is valued at from $300 to $1,100 per acre. The investigations have also brought out many details of structure not previously known, which are of the utmost importance to mine and oil and gas well operators. In closing Mr. Campbell expressed a high appreciation of the labors of the geologists who had preceded him in this field, and stated that their results can only be superseded by the most careful detailed work and by the use of a topographic base map producing a high degree of accuracy.

ALFRED H. BROOKS,
Secretary.

BIOLOGICAL SOCIETY OF WASHINGTON.

THE 347th meeting was held on Saturday evening, January 11.

F. A. Lucas exhibited a malformed tooth of Mastodon, of an irregular shape, and with about twice the normal number of cusps, the extra cusps having been mostly added on one side of the tooth.

M. B. Waite presented 'A Problem in Plant